Frequency curves shown by summation diagrams—Deviation from the mean; Standard deviation; Coefficient of variation; Computation of coefficient from grouped data; Probable error; Doubtful observations; The probability scale; Probability cross-section paper. Another use of probability; The frequency curve as a conception. XIII. Correlation: Correlation and causality; Laws of causation; Methods of correlation; Galton's coefficient of correlation; Example of low correlation—Correlation shown graphically; Correlation table; Use of mathematical formulæ; Secondary correlation; The lag—Coefficient of correlation and the lag; Other secondary correlations; The epidemiologist's use of correlation. XIV. Life Tables: Probability of living a year; Mortality tables; Most probable life-time; "Vie probable"; Expectation of life; Comparison of the three methods; Life-tables based on living populations; Mathematical formulæ; Early history of life-tables; Recent life tables; United States Life Tables: 1910; A few comparisons. XV. A Commencement Chapter: Military statistics; Industrial diseases; Accidents; Infantile paralysis; Sanitary index.

EDWARD L. DODD.

The Sumner Line, or Line of Position as an Aid to Navigation. By GEORGE C. COMSTOCK. New York, Wiley. 6 + 70 pages. 12 mo. Price $1.25.

This is one of a dozen or more of little books on navigation that have appeared within the past two years as a result of the increased activity of the Navy and the Merchant Marine. Many teachers of the subject have apparently felt that the standard American text book on navigation, "The American Practical Navigator," originally by Nathaniel Bowditch, is, in some respects, open to criticism, and they have tried to improve upon the explanations and methods used in various parts of the book.

Professor Comstock has confined his book to problems connected with the determination of the Line of Position, the method of locating a ship at sea, which has been adopted by the U. S. Navy.

Presuming familiarity on the part of the reader with the elements of navigation, the Nautical Almanac, and such instruments as the sextant, compass, chronometer, and log, the author begins with an explanation of the sub-solar point, *i. e.*, the point on the earth directly under the sun (or any other heavenly body). He then takes up the Circle of Equal Altitude, and the location, by the methods of St. Hilaire and de Aquino, of the Line of Position or that part of the Circle of Equal Altitude which is in the vicinity of the observer's ship.

The theory of the spherical traverse tables is fully explained, and their use is illustrated not only in finding the azimuth and the "calculated" altitude, but also in solving such problems as finding the amplitude, the time when a star will cross the Prime Vertical, and the identification of an unknown star.

One of the novel features of the book is the method of finding the coördinates of the intersection of two Lines of Position. This is commonly done at sea by plotting the lines on a chart. In Bowditch and in other epitomes, methods, based on the solution of right triangles, are given for computing the coördinates of intersection when a chart is not available. Professor Comstock has resorted to analytical geometry and has expressed his results in terms which can be handled by the use of plane traverse tables. This is of interest from a mathematical point of view, but probably will not become popular with practical navigators because of the many possibilities of mistakes, especially in algebraic signs.

Another feature of the book is the revival of horizon observations. Methods of determining the longitude from sunrise and sunset observations used to be given in the old epitomes, but, on account of the uncertainty of refraction near the horizon, those methods were omitted years ago. Professor Comstock has prepared a special table of Horizon Corrections for different temperatures and pressures, which, under normal conditions at sea, ought to enable the navigator to get fairly good results from horizon sights.

Throughout the book Forms are used for the systematic arrangement of the computations, and, to accompany the book, pads of Blank Forms have been prepared for working the St. Hilaire or de Aquino methods of finding the Line of Position. On each blank is a skeleton chart for plotting the lines.

F. SLOCUM.